

CLAIMS

1. A pump/motor, comprising:
 - a back plate having first and second fluid ports configured to be differentially pressurized;
 - a plurality of reaction plates rigidly coupled to the back plate;
 - a valve plate slideably coupled to the back plate and having first and second fluid feed channels configured to receive fluid from the first and second fluid ports; and
 - a plurality of hold-down pistons positioned in respective hold-down cylinders formed in the valve plate, each of the hold-down pistons configured to be biased, by pressurized fluid in the respective hold-down cylinder, against a surface of one of the reaction plates.
2. The pump/motor of claim 1 wherein the valve plate is configured to slide against the back plate in an arc exceeding around 20 degrees of rotation.
3. The pump/motor of claim 1 wherein the plurality of hold down pistons is distributed along first and second edges of a same surface of the valve plate.
4. The pump/motor of claim 3 wherein at least one of the hold down pistons distributed along the first edge of the valve plate is in fluid communication with the first fluid feed channel and at least one of the hold-down pistons distributed along the second edge of the valve plate is in fluid communication with the second fluid feed channel.
5. The pump/motor of claim 4 wherein at least one of the hold down pistons distributed along the first edge of the valve plate is in fluid communication with the second fluid feed channel and at least one of the hold down pistons distributed

along the second edge of the valve plate is in fluid communication with the first fluid feed channel.

6. The pump/motor of claim 1 wherein each of the plurality of hold-down pistons comprises an aperture passing along a central axis from a first surface to a second surface thereof.

7. The pump/motor of claim 1, further comprising:
a barrel, rotatably coupled to the valve plate and having a plurality of drive cylinders formed therein;
a plurality of drive pistons, each having a first end positioned in a respective one of the plurality of drive cylinders; and
a thrust plate having a surface configured to receive second ends of each of the plurality of drive pistons, the thrust plate coupled to a drive shaft of the pump/motor.

8. A hydraulic machine, comprising:
a back plate having a concave surface configured to slideably receive a valve plate thereon;
first and second fluid ports formed in the concave surface and configured to transmit differentially pressurized fluid to the valve plate; and
first and second reaction plates coupled to the back plate, each having a convex reaction surface substantially facing, and spaced a selected distance from, the concave surface of the back plate.

9. A hydraulic machine, comprising:
a back plate having a concave sliding surface;

a valve plate having a convex sliding surface configured to mate with the concave sliding surface of the back plate, the valve plate further configured to slide against the back plate;

means for sliding the valve plate against the back plate to change a displacement of the hydraulic machine; and

means for biasing the valve plate against the back plate.

10. A method, comprising:

coupling a first pressurized fluid source to a rotatable barrel via a first fluid feed channel in a valve plate and a first fluid port in a back plate;

coupling a second pressurized fluid source to the rotatable barrel via a second fluid feed channel in the valve plate and a second fluid port in the back plate;
and

biasing a plurality of hold-down pistons against a reaction plate coupled to the back plate.

11. The method of claim 10 wherein biasing the plurality of pistons further comprises coupling at least one of the plurality of hold-down pistons to the first pressurized fluid source via the first fluid feed channel and the first fluid port.

12. The method of claim 11 wherein biasing the plurality of pistons further comprises coupling at least one of the first plurality of hold-down pistons to the second pressurized fluid source via the second fluid feed channel and the second fluid port.